REMARKS/ARGUMENTS

Claims 1 – 32 are pending in this application. Claims 1 – 15 are withdrawn from consideration. Claims 16 - 32 are rejected under 35 USC § 102(b). No new matter has been added. In view of the following remarks, reconsideration and allowance of all pending claims are respectfully requested.

Request for Withdrawal of Finality of Office Action

In accordance with Section 706.07 (c) of the Manual of Patent Examining Procedure (MPEP), Applicant wishes to request that the Examiner withdraw the finality of the present office action.

As stated in section 706.07(a) of the MPEP, a second action on the merits should **not be made final** when the Examiner introduces a new ground of rejection that is neither necessitated by Applicant's amendment of the claims, nor based on information submitted in an information disclosure statement (IDS) pursuant to 37 C.F.R. § 1.97(c).

The Applicants have timely filed an Information Disclosure Statement on May 21, 2004, which was acknowledged on the record in the September 6, 2005 office action. No other Information Disclosure Statements have been presented by the Applicants.

The Applicants have been provided a single non-final office action dated September 6, 2005. In the September 6, 2005 office action: Claims 16 – 20 were rejected under 35 U.S.C. § 102(b) as being anticipated by US Patent No. 6,177,787 to Holbrecht. No other reference was presented as a basis of rejection on the record. The Examiner characterized the pertinent prior art of record to include: US Patent No. 4,837,495 to Zansky, US Patent No.

6,522,116 to Jordan, and US Patent No. 6,611,131 to Edwards. The Examiner noted additional references on form PTO-892, including: US Patent No. 4,403,279 to Hirsch et al., and US Patent No. 6,661,224 to Linder.

Applicants timely filed a response to the September 6, 2005 office action on December 6, 2005, where: Applicants traversed the rejection to claims 16 – 20 for anticipation under 35 U.S.C. § 102(b), Claims 16 – 20 were left in original form without amendment, no new matter was added, and the scope of the independent claims (16 and 19) did not change. The new claims added (21 – 32) were in dependent form, which by definition narrower in scope to the independent claims 16 and 19, and thus do not expand the scope of the subject matter claimed.

In the present Office Action dated February 24, 2006: the Office Action states that: "Applicant's arguments with respect to claims 16 – 19 have been considered but are moot in view of the **new ground(s) of rejection**", and claims 16 – 32 are rejected for anticipation under 35 U.S.C. § 102(b) as being anticipated by US Patent No. 5,731,731 to Wilcox. Firstly, claims 16 – 20 were previously rejected on the record and the above statement does not provide any guidance with respect to claim 20. Secondly, the Wilcox reference was not previously presented in the prosecution record and is now introduced for the first time. Thirdly, additional references that were not previously presented on the record are introduced for the first time via form PTO-892 as: US Patent No. 5,079,453 to Tisinger et al., and US Patent No. 5,315,498 to Bewrrios et al.

For the reasons stated above, the present Office Action introduces new grounds of rejection with the addition of three newly cited references. Since the Applicants previously traversed the prior introduced grounds of rejection without amending any of the independent

claims, the new basis of rejection is not necessitated by Applicants' actions. The Applicants have not been given a fair opportunity to fully evaluate such newly presented references, and it is respectfully requested that the Finality of the present Office Action be withdrawn.

Claim Rejections under 35 U.S.C. § 102(b)

Claims 16 – 32 are rejected under 35 U.S.C. § 102(b) as being anticipated by US Patent No. 5,731,731 to Wilcox.

Applicant believes that at least the following limitation is not taught by any of the cited references as are found in Applicant's claim 16: "dynamically adjusting a slope associated with a ramp signal in response to the measurement signal", and "compensating a response associated with a control loop in the switching regulator with the ramp signal such that the control loop is responsive to changes in inductor current slope." Applicant further believes that similar claim elements found in claim 19 are also not taught, disclosed, or otherwise suggested by the cited references.

Regarding claims 16 and 19, the Office Action states that the *Wilcox* reference discloses an apparatus and method for adjusting slope compensation in a switching regulator in FIGS. 3 and 5, where the means for providing a measurement signal is identified as voltage supply VIN, the measurement signal is identified as IL, the slope is provided via oscillator 122, the means for adjusting the slope is identified as control logic 121, the ramp signal is provided by MOSFET circuits 132 and 333, and the means for compensating the response associated with the control loop is identified as drivers 132 and 333. The Office Action further states that the control loop is responsive to changes in inductor value via the measurement signal IL. Each of these assertions are believed to be incorrect for the reasons that will be described in detail below.

Applicants have reviewed the schematics of FIGS. 3 and 5, and the related description in the detailed description of Wilcox for an understanding as to the operation of the various electrical components in PWM Control circuit 120, output circuit 330, output control circuit 340, and control routing circuit 350.

PWM control circuit 120 is identified as a prior art PWM controller (see e.g., col. 6, lines 28 – 30). The PWM control circuit is arranged to adjust the peak current that is delivered through the inductor during each switch cycle to a level that is demanded by the load (See Col. 4, lines 54 – 62). PWM controllers adjust the ON time associated with the power switching devices (e.g., 134) to attempt to keep a relatively constant output voltage, which is precisely the case described for FIGS. 3 and 5. For example, col. 4, lines 39 – 43 state: "Oscillator 122 causes control logic 121 to provide an ON pulse at a constant frequency to driver 132. Each ON pulse causes driver 132 to turn MOSFET 134 ON, thereby turning diode 136 OFF, and causing inductor current IL to increase."

Nothing in the Wilcox reference describes, teaches, or otherwise suggests that a ramp signal is generated such as described in Applicant's claims 16 and 19. Moreover, nothing in the *Wilcox* reference teaches to adjust a slope associated with the ramp signal **in response to the measurement signal.**

The measurement signal suggested in the present office action corresponds to "IL". However, IL in the *Wilcox* reference is not a measurement signal at all and is instead a label to show that current is flowing in the inductor. The Office Action further recites that the measured parameter is current. It is inconceivable that *Wilcox* is intended to teach that a

measurement signal (IL) actually corresponds to the very thing being measured (IL actually is the current in inductor 138).

The Office Action further states that voltage supply VIN is the means for providing the measurement signal. However, IL is not a measurement signal and VIN is a power supply voltage for the MOSFETs 134 and 335. MOSFETs 134/335 are turned ON and OFF according to a variable pulse width as typically required for switching operation in all PWM controllers. When MOSFETs 134/335 are in an OFF state, VIN is completely decoupled from current IL and current IL flows through diode 136 (often referred to as a freewheeling diode) to inductor 138. Since IL is flowing when VIN is completely decoupled from the path of inductor 138, the purported measurement signal (IL) is not provided by VIN (the purported means for providing a measurement signal).

It is further believed that the *Wilcox* reference fails to teach, suggest or otherwise disclose to generate a ramp signal as described in Applicants' claims 16 and 19. According to the disclosure of *Wilcox*, Control logic 121 provides a digital type output signal that is either ON or OFF (See col. 4, lines 34 – 53). Oscillator 122 is operated with a constant frequency in the PWM controller (See col. 4, lines 38-41). The frequency of the oscillator determines the maximum amount of time that the inductor can be charged (when coupled to the power through a switch) and discharged (when decoupled from the power). Assuming the oscillator frequency was changed, even through it is contrary to the constant frequency operation taught by *Wilcox*, the slope for charging and discharging the inductor would not change. In fact, changing the oscillator frequency will not change anything in the circuit other than the duty cycle for the ON and OFF times of the inductor (138).

Drivers 132 and 333 are arranged to turn ON and OFF the MOSFET devices 134 and 335, respectively. The Office Action states that these drivers (132 and 333) are the means for compensating the response associated with the control loop with the ramp signal. This statement is incorrect as is clear from the operation of the circuits of FIG. 3 and FIG. 5. First of all there is no explicit or implicit discussion of slope compensation in the *Wilcox* reference. Second of all there is no discussion of a ramp signal in *Wilcox* that comports with Applicant's claims 16 and 19. Third of all, the changeover between drivers 132 and 333 is accomplished by switch 350, which is responsive to changes in the output voltage (VOUT). For example, comparator 344 compares voltage VG to VREF2, where changes in VG track changes in VOUT via differential amplifier 128 and resistor divider 125/126. It is important to note that, the comparator is not evaluating a change in slope of the measurements signal and instead merely evaluating a scaler value (a value that does not have magnitude and phase angle such as a vector quantity, which would indicate a slope). It is only through impermissible hindsight reconstruction that the present Office Action arrives at the Applicant's invention as described in Claim 16 and 19.

Regarding Claim 17, the Office Action states that *Wilcox* discloses adjusting the slope associated with the ramp signal by changing a capacitance value that is associated with the ramp generator. Interestingly, capacitor 131, which is the principal support stated for this assertion has absolutely no effect on any ramp signal (if a ramp signal can even be demonstrated). Capacitor 131 is a power supply decoupling capacitor that helps reduce noise in the power supply line, and also helps to provide a temporary source of current when the power supply voltage (VIN) from 104 momentarily dips. Nothing in the *Wilcox* reference even

remotely demonstrates that changing the value of capacitor 131 has any effect whatsoever on any ramp signal. Moreover, there is no mechanisms taught in the *Wilcox* reference to change the capacitance value (or the ratio of the charging current to the capacitance value) responsive to the measurement signal as is found in Applicant's claim 17. It is once again through impermissible hindsight reconstruction that such conclusions are reached.

Regarding claims 18 and 20, the Office Action states that Wilcox discloses a means for dividing the reference signal with the measurement signal to provide a ratio, and a means for changing the slope that is associated with the ramp signal in response to the ratio such that the slope of the ramp is changed. The Office Action refers to PWM controller 120 as the means for dividing and output control circuit 340 as the means for changing the slope of the ramp signal. For all of those reasons previously stated, there is no teaching in Wilcox of a ramp signal that comports with Applicant's claims. Furthermore, there is no explicit or implicit teaching in the *Wilcox* reference for a means for dividing. The Examiner is kindly directed to FIGS. 7 – 9 of Applicant's disclosure, which fully illustrate that two different signals are mathematically divided to provide the ratio signal, as is referred to in Applicant's claims. Since nothing in the *Wilcox* reference illustrates, teaches or otherwise suggests a division operation between two signals, Applicants do hereby seasonably challenge the above assertion.

Regarding claims 21 and 27, the Office Action states that *Wilcox* discloses measuring a current slope associated with current flowing in the inductor. The Office Action states that control logic 121 provides such a current slope measurement. While it may be possible for some control logic circuits to measure a current slope, it is clearly not possible for the *Wilcox* reference to perform a current slope measurement with control logic 121. In order to

make a measurement of current slope, the control logic 121 would have to measure two magnitudes of current (e.g., I1, I2), and two time measurements (e.g., t1, t2). Control logic 121 would then have to determine slope as: (I2 – I2)/ (t2 – t1). Control logic 121 does not have access to any measure of current in inductor 138. Control logic's only input in the system is the output of comparator 129, which is a digital logic 0 value or a digital logic 1 value. It is thus not possible to measure slope with control logic 121 in this configuration. A review of the text of *Wilcox* does not describe, teach, or otherwise suggest such a measurement. It is once again through the use of impermissible hindsight reconstruction that such conclusions are reached.

Regarding claims 22 and 28, the Office Action states that *Wilcox* discloses adjusting the slope associated with the ramp signal by adjusting the slope in response to the measured current slope with: a matched slope, a fraction of a downward slope, or a multiple of the downward slope. For at least those reasons previously stated above it is believed that *Wilcox* does not teach measuring the slope associated with the current in the inductor as is found in Applicant's claims. Moreover, *Wilcox* makes no mention of matched slopes, fractional slopes, and multiples of slopes as is found in Applicant's claims. Applicant seasonably challenges this assertion and requests that a reference be provided or the rejection withdrawn.

Regarding claims 23, 24, 29 and 30, the Office Action states that *Wilcox* discloses measuring a current slope associated with current flowing in the inductor. The Office Action again relies upon control logic 121 as the sole support for the claim of measuring the current slope. As described previously above, control logic 121 is not capable of measuring a current slope and it is requested the rejection be withdrawn.

Regarding claims 25 and 31, the Office Action states that *Wilcox* discloses means for monitoring an output voltage to provide a first current signal, generating a second current signal as a measurement signal, summing the first current signal with the second current signal, and adjusting the slope of the ramp signal in response to the sum. The Office Action states that output drive 330 includes a means for monitoring the output voltage that satisfies these claims, and that comparator 129 sums the first current signal and the second current signal. These assertions are unfounded and unsupported by the description of *Wilcox*. First of all, nothing in the disclosure of *Wilcox* teaches explicitly or implicitly to measure two current signals. Second of all, the Office Action fails to identify with any specificity where the purported two current signals are located and merely leaves it as an exercise for the Applicant to guess. Third of all, it is entirely unclear as to how comparator 129 is summing together any currents since it is a voltage comparator. Lastly, there is no mechanisms described implicitly or explicitly that provide support for adjusting a slope in response to the purported sum of currents. It is requested that the rejection be withdrawn.

Regarding claims 26 and 32, the Office Action states that *Wilcox* discloses that adjusting the slope of the ramp signal corresponds to an integration of the sum of the first and second current signals with a capacitor circuit (131). As previously stated, capacitor 131 has no effect on anything other than the stability and noise from the power supply pin (104). Moreover, capacitor 131 has no relation to anything that can be construed as a slope as is described in Applicants claims. It is requested that the rejection be withdrawn.

CONCLUSION

In view of the foregoing remarks, all pending claims are believed to be allowable and the application is in condition for allowance. Therefore, a Notice of Allowance is respectfully requested. Should the Examiner have any further issues regarding this application, the Examiner is requested to contact the undersigned attorney for the applicant at the telephone number provided below.

Respectfully submitted,

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